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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

ADVISORY ACTION

This is in response to the Amendment After Final dated March 28, 2008. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Response to Arguments

Claim Objections

Claims **1 and 3** have been objected to because of minor informalities.

- The objection of claim 3 has been withdrawn in view of Applicants' amendment.

- The objection of claim **1** is as applied in the Office Action dated September 28, 2007 and incorporated herein. The objection has been maintained for the following reasons:

Claim 1

line 3, recites "a metal material article to be treated".

line 5, recites "said metal material article".

lines 6-7, recites "said metal material article having electrical conductivity".

The "said metal material article having electrical conductivity" recited in claim 1, lines 6-7, lacks antecedent basis if it is the same as the metal material article to be treated recited in claim 1, lines 3 and 5. The words "having electrical conductivity" should be deleted in lines 6-7 if it is the same.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

I. Claims **1-5 and 8-17** have been rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The rejection of claims 1-5 and 8-17 under 35 U.S.C. 112, first paragraph, has been withdrawn in view of Applicants' amendment.

II. Claims **1-5 and 8-17** are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

· The rejection of claim 1, line 16; claim 2, lines 3-4; and claims 3-5, 9, 13-14 and 17 under 35 U.S.C. 112, second paragraph, has been withdrawn in view of Applicants' amendment.

· The rejection of claims **1-2 and 8** have been under 35 U.S.C. 112, second paragraph, is as applied in the Office Action dated April 5, 2007 and/or September 28, 2007 and incorporated herein. The rejection has been maintained for the following

reasons:

Claim 1

line 18, recites “a metal material article to be treated of a steel material”.

Applicants state that the metal material article to be treated may be a material other than a steel material.

In response, since the metal material article to be treated of a steel material (from claim 1, lines 19-20) is not recited as further limiting the metal material article (from claim 1, lines 5-6), then claim 1 reads on having **both** the metal material article (from claim 1, lines 5-6) and the metal material article to be treated of a steel material (from claim 1, lines 19-20) in the phosphate chemical treatment bath. Is this an enabling embodiment that is supported by Applicants’ specification?

lines 12-13, recites “a hydrogen standard **electrode potential**”.

line 24, recites “the hydrogen standard **electrode**”.

An electrode potential is not the same as an electrode. Thus, “the hydrogen standard electrode” lacks antecedent basis.

Claim 2

lines 2-3, recites “an electrode material that dissolves in the treatment bath”.

Applicants state that the Fe electrode or the metal material article to be treated of a steel material (from claim 1, lines 19-20) is the same as the electrode material that

dissolves in the treatment bath.

In response, since the electrode material that dissolves in the treatment bath (from claim 2, lines 2-3) is not recited as further limiting the Fe electrode or the metal material article to be treated of a steel material (from claim 1, lines 19-20), then claim 2 reads on having **both** the Fe electrode or the metal material article to be treated of a steel material (from claim 1, lines 19-20) and the electrode material that dissolves in the treatment bath (from claim 2, lines 2-3) in the treatment bath. Is this an enabling embodiment that is supported by Applicants' specification?

Claim 8

line 2, "the metal ions that form a complex with ***the phosphoric acid***" lack antecedent basis.

Claim 1, line 8, recites "metal ions that form a complex with ***the phosphate ions***". Complexing with the phosphate ions (PO_4^{3-}) is not the same as complexing with phosphoric acid ($\text{H}_3\text{PO}_4 \rightarrow \text{H}_2\text{PO}_4^-$ ions).

Claim Rejections - 35 USC § 103

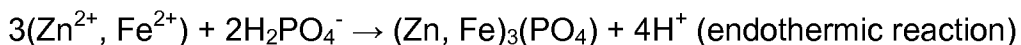
Claims **1-5 and 8-17** have been rejected under 35 U.S.C. 103(a) as being unpatentable over **EP 1,074,640 A1** ('640) in combination with **Matsuda** (US Patent No. 5,645,706).

The rejection of claims 1-5 and 8-17 under 35 U.S.C. 103(a) as being

unpatentable over EP 1,074,640 A1 ('640) in combination with Matsuda is as applied in the Office Action dated September 28, 2007 and incorporated herein. The rejection has been maintained for the following reasons:

Applicants state that '640 discloses only a phosphate treatment method in which pH is broadly disclosed to be .5-5.0; and wherein ORP is broadly disclosed to be 200-1000 mV.

In response, Matsuda teaches:



[Chemical Equation 4]



(col. 3, lines 1-16; and col. 13, line 38)

Matsuda teaches that **for an ORP of 560 mV (= 770 mV of a hydrogen standard electrode potential) or greater**, it is necessary to further oxidize the ferrous ion (Fe^{2+}) dissolved from the iron material. However, if thermal energy is not directly used to form the coating in the non-electrolytic bath, then the only energy supplied to the treatment bath is the energy which accompanies the dissolution of the iron (Chemical Equation 3). With that energy alone, the equilibrium of Chemical

Equation 10 cannot be shifted towards the right.

However, since according to the present invention electrical energy is supplied by the electrolytic treatment, the iron is dissolved and oxidized by Chemical Equations **3** and **10**, causing the treatment bath to contain both Fe^{2+} and Fe^{3+} , and so the ORP may be 560 mV or greater. In addition, the reaction of the formation of the film (Chemical Equation **4**) is also promoted, and thus the formation of the chemical film takes place. Since Fe^{3+} is stably present in the bath with an ORP of 560 mV or greater, the chemical treatment coating which is formed is assumed to be a phosphate chemical coating including iron in the form of both Fe^{2+} and Fe^{3+} (col. 13, lines 39-58).

A phosphate chemical treatment bath is a solution of pH (hydrogen ion concentration) of 2-4 which contains a large amount of phosphoric acid. At **pH of 2-4**, the phosphoric acid exists in the solution in a state of equilibrium of Chemical Equation 5 (col. 7, lines 23-26). The hydrogen ion concentration (pH) is preferably in a range of about 2.5-4.0 (col. 14, lines 27-28).

Matsuda teaches an ORP of 770 mV or greater and a pH of 2, which is encompassed by the ORP of 200-1000 mV and pH of 0.5 to 5 disclosed by EP '640 (page 24, Table 5). The discovery of optimum values of result effective variables in a known process is ordinarily within the skill of the art. *In re Boesch and Slaney* 205 USPQ 215 (CCPA 1980).

Applicants state that nowhere does '640 disclose prohibiting the formation of

excess Fe^{3+} , thereby prohibiting non-film forming reactions.

In response, it is well settled that unpatented claims are given the broadest, most reasonable interpretation and that limitations are not read into the claims without a proper claim basis therefor. *In re Prater* 415 F. 2d 1393, 162 USPQ 541 (CCPA 1969); *In re Zeltz* 893 F. 2d 319, 13 USPQ 1320.

Claim 1 does not recite prohibiting the formation of excess Fe^{3+} (ferric ion).

Furthermore, the Applicant has a different reason for, or advantage resulting from doing what the prior art relied upon has suggested, it is noted that it is well settled that this is not demonstrative of nonobviousness. *In re Kronig* 190 USPQ 425, 428 (CCPA 1976); *In re Linter* 173 USPQ 560 (CCPA 1972); the prior art motivation or advantage may be different than that of Applicants while still supporting a conclusion of obviousness. *In re Wiseman* 201 USPQ 658 (CCPA 1979); *Ex parte Obiaya* 227 USPQ 58 (Bd. of App. 1985) and MPEP § 2144.

Applicants state that '640 nowhere discloses substantially separating NO_2 and N_2O_4 from the treatment bath.

In response, EP '640 teaches that unavoidably formed reaction products (sludge) and nitrides (such as **NO_2**) formed by reduction of nitrate ion other than on the surface of the article to be treated by electrolysis reaction ***can be removed from the treatment bath*** (page 9, [0076]).

This teaching would have suggested to one having ordinary skill in the art that

NO₂ is separated from the treatment bath as well as any N₂O₄ that would have inherently been formed in such a treatment bath. Similar processes can reasonably be expected to yield products which inherently have the same properties. *In re Spada* 15 USPQ 2d 1655 (CAFC 1990); *In re DeBlauwe* 222 USPQ 191; *In re Wiegand* 86 USPQ 155 (CCPA 195).

Applicants state that thus, '640 teaches directly away from the claimed pH and ORP, and nowhere discloses or suggests the claimed specific combination of pH and ORP values, in combination with 1) separating NO₂ and N₂O₄ from the treatment bath, and 2) replenishing the Fe ions.

In response, a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. *W.L. Gore & Associates, Inc. V. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), *cert. Denied*, 469 U.S. 851 (1984). In addition, a known or obvious composition does not become patentable simply because it has been described as somewhat inferior to some other product for the same use, see *In re Gurley*, 27 F.3d 551, 554, 31 USPQ2d 1130, 1132 (Fed. Cir. 1994). Further, a reference may be relied upon for all that it would have reasonably suggested to one having ordinary skill in the art, including nonpreferred embodiments, see *Merck & Co. v. Biocraft Laboratories*, 874 F.2d 804, 10 USPQ2d 1843 (Fed. Cir.), *cert. denied*, 493 U.S. 975 (1989). See MPEP § 2141.02, MPEP § 2145X.D.1 and MPEP § 2123.

Furthermore, there is no requirement that the claim limitations be expressly articulated in one or more of the references. References are evaluated by what they collectively suggest to one versed in the art, rather than by their specific disclosures. *In re Simon* 174 USPQ 114 (CCPA 1972); *In re Richman* 165 USPQ 509, 514 (CCPA 1970).

Applicants state that '640 fails to teach controlling the amount of Fe ions dissolved in the treatment bath as required by claim 1.

In response, Matsuda teaches controlling the amount of Fe ions dissolved in the treatment bath. Matsuda teaches that the treatment bath contains paramagnetic ion (Fe^{3+}). The magnetic field must not be allowed to influence the circulation cycle. If the magnetic field acts on the treatment bath, then it will affect the paramagnetic components (Fe^{3+}), and as a result the Fe^{3+} will dissolve in the treatment bath and disappear, leaving no Fe^{3+} in the treatment bath. Consequently, the ORP will by necessity fall below 560 mV (col. 29, lines 34-47). The electrolytic reaction system is separated into a "main electrolysis system" and a "secondary electrolysis system" to **control the iron component** contributing to the formation of the coating (col. 29, lines 37-40; and col. 29, line 66 to col. 30, line 2).

Applicants state that Matsuda is entirely different, as an *electroless* system, than the claimed *electrolytic* system.

In response, Matsuda teaches an electrolytic system. Matsuda teaches that according to his invention ***electrical energy is supplied by the electrolytic treatment***, the iron is dissolved and oxidized by Chemical Equations **3** and **10**, causing the treatment bath to contain both Fe^{2+} and Fe^{3+} , and so the ORP may be 560 mV or greater (col. 13, lines 48-52). An ***electrical current*** is caused to pass through the phosphate chemical treatment solution by connecting the electroconductive metal and the phosphate chemical treatment solution to an electric power source (col. 31, lines 60-64).

Applicants state that Matsuda's 13 examples are limited to a bath having a pH of more than 2.5 in combination with an ORP of less than 800 mV.

In response, disclosed examples and preferred embodiments do not constitute a teaching away from a broader disclosure or nonpreferred embodiments (MPEP § 2123 (II)).

Applicants state that this combination of high pH and low ORP, as well as being an electroless system, undoubtedly contributes to Matsuda's sludge problem because, for example, Fe does not fully remain in solution in a bath having an ORP of below 770 mV, which is one reason that Matsuda's method *requires* a pump.

In response, Matsuda teaches an ORP of 460-**860** mV of a hydrogen standard potential (col. 13, lines 16-18) and a pH of **2-4** (col. 8, lines 23-26).

Applicants' (method) claim 1 is open to the use of a pump and recites that sludge is formed (claim 1, lines 15-16).

Response to Amendment

Claim Rejections - 35 USC § 112

Claim **17** is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 17

lines 3, the word -- the -- should be inserted before "NO₂". See claim 1, lines 21-22.

line 4, the word "comprising" should be amended to the word -- comprises --.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to EDNA WONG whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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/Edna Wong/
Primary Examiner
Art Unit 1795

EW
April 6, 2008